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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,513	03/27/2004	Charles K. Heizer	71044-014	1174

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HUSCH & EPPENBERGER, LLC  
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ST. LOUIS, MO 63105-3441

EXAMINER

TRIEU, THERESA

ART UNIT PAPER NUMBER

3748

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/810,513

Applicant(s)

HEIZER, CHARLES K.

Examiner

Theresa Trieu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22, 24, 26-29, 31-47, 49-51, 53-70, 72, 87, 99 and 104 is/are pending in the application.
- 4a) Of the above claim(s) 23, 25, 30, 48, 52, 54-59, 71, 73-86, 88-98, 100-103, 105-110 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31-47, 49-51 and 53-60 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 7, 11-14, 61-67, 72, 87, 99 and 104 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 8-10, 15-22, 24, 26-29 and 68-70 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>March 27, 2004</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

This Office Action is responsive to the applicants' election/restriction filed on October 27, 2004.

#### ***Election/Restrictions***

1. Applicant's election of species of Figs. 8A-8D, 9, 10A-10D and 11A-11H is acknowledged, claims 1-22, 24, 26-29, 31-47, 49-51, 53-70, 72, 87, 99 and 104 being readable thereon. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

#### ***Specification***

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

#### ***Claim Objections***

3. Claims 1-22, 24, 26-29, 31-47, 49-51, 53-70, 72, 87, 99 and 104 are objected to, in that their subject matter needs to be incorporated into the specification and the drawings (see Fig. 10C); (i.e. leading side, trailing side, leading ridge, bottom face....)

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claims 1-3, 6, 7, 11-14, 61-67, 87, 99 and 104 are rejected under 35 U.S.C. 102(b) as being anticipated by Rao et al. (Rao) (Patent Number 5,554,020).***

Regarding claims 1-3, 6, 7, 11 and 14 as shown in Figs. 1-3, Rao discloses a screw rotor device for positive displacement of a working fluid, comprising a female/male rotor (15, 16) comprising a major/minor diameter and a helical groove/thread; a helical groove/thread comprising a bottom/top land (not numbered; however, clearly seen in Fig. 17) situated between a leading side and trailing side, the leading side and the trailing side respectively comprising a leading ridge and a trailing ridge at the major diameter (see Figs. 16 and 17); wherein the top land is in a first sealing relationship (see Fig. 1) with the bottom land, wherein the trailing face is in a second sealing relationship with the trailing ridge, wherein the trailing edge is in a third sealing relationship with the trailing side; a housing comprising a front and back sides (not numbered; however, clearly seen in Fig. 2); a first and second ends, an inlet/outlet ports (20, 24); and a pair of cylindrical bore (13) extending between the first and second ends; wherein the leading face is in a fourth sealing relationship with the leading ridge, wherein the leading edge is in a fifth sealing relationship with the leading side, wherein the trailing ridge and the trailing edge are in six relationship with each other and wherein the leading ridge and the leading edge are in seven sealing relationship with each other; the major diameter of the female rotor is in an eight sealing relationship with one of the pair of cylindrical bore, wherein the top land of the thread is in a ninth sealing relationship with another of the pair of cylindrical bore, and wherein the major diameter of the female rotor is in a tenth sealing relationship with the minor diameter of the male rotor.

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Regarding claims 12-13 and 99, Rao further discloses a back/front intersection does not include a back/front blow hole between the helical thread (see Fig. 1), the helical groove and the back/front cusps; the intermeshing sealing area further comprising a center sealing area between the top land and bottom land.

Regarding claims 61-67, 87 and 104, as shown in Fig. 1, Rao discloses a screw rotor product for positive displacement of a working fluid, comprising a housing comprising an inlet/outlet ports (20, 24); a female and male rotors (15, 16) comprising a major/minor diameter and a plurality of helical grooves/threads, wherein the thread groove pairs bound a plurality of non-communicating spaces within the cylindrical bore (11), seal the working fluid within in the housing and transition between the meshing with each other and sealing around the housing while maintaining the sealing of the working fluid in the non-communicating spaces; the plurality of non-communicating spaces (28) are comprised of a plurality of contiguous boundary areas comprising at least one intermeshing sealing area (21); the intermeshing sealing area comprising a leading face and leading side in the one of the thread groove pair and a trailing face and a trailing side in the adjacent thread-groove pair (see Fig. 1); the helical thread and groove intermeshed at the inlet port (20) and closed off the spaces from the inlet to seal the working fluid in the housing (14); a cross sectional profile of the male rotor comprising a tooth, an adjacent tooth and a toothless sector (not numbered; however, clearly seen in Fig. 1), the tooth being subtended by a first arc angle and the toothless sector comprising a second arc angle that is at least twice the first arc angle.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***5. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rao in view of design choice.***

Rao discloses the invention as recited above; however, Rao fails to disclose the positive displacement of the working fluid between the inlet and outlet ports being produced by the female and male rotors with a thermodynamic efficiency of at least 85%.

It is examiner's position that one having ordinary skill in the screw compressor art, would have found it obvious to utilize the female and male rotors producing with a thermodynamic efficiency of at least 85%, since they are merely design parameters, depending on temperature, pressure, or stress acted/applied on the female and male rotors. Moreover, there is nothing in the record which establishes that the claimed range of the thermodynamic efficiency of the female and male rotors with under such conditions, presents a novel or unexpected result (See *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975)).

***Allowable Subject Matter***

6. Claims 4, 5, 8-10, 15-22, 24, 26-29, 68-70 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 31-47, 49-51, 53-60 are allowed

***Prior Art***

The IDS (PTO-1449) filed on March 27, 2004 has been considered. An initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of four patents: Walls (U.S. Patent Number 3,282,495), Nomura et al. (U.S. Patent Number 4,781,553), Marayama et al. (Patent Number 5,533,887); Staat (U.S. Patent Number 6,612,820), each further discloses a state of the art.

***Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa Trieu whose telephone number is 571-272-4868. The examiner can normally be reached on Monday-Friday 8:30am- 5:00pm. The new telephone number is 571-272-4868 that will become effective after November 22, 2004.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E Denion can be reached on 571-272-4859. The new telephone number is 571-272-4859 that will become effective after November 22, 2004. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TT



Theresa Trieu  
Patent Examiner  
Art Unit 3748